



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Ballistic Protection

Jeffrey A. Koshko
Deputy Associate Director
Ground System Survivability
United States Army RDECOM-TARDEC

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Mission

- Mature Armor Systems from TRL 4 to TRL 6 to fulfill ground vehicle PM needs.

Base Armor

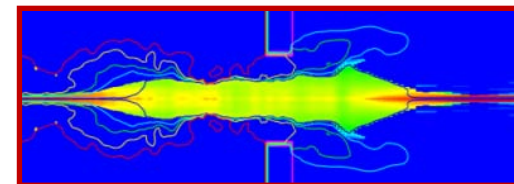
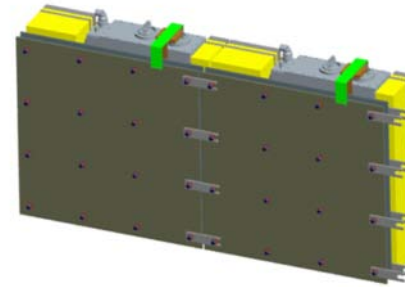
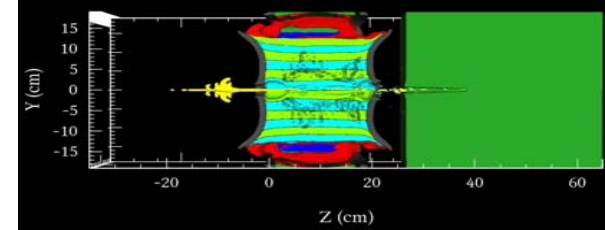
- Small Arms/Frag Opaque B-kits
- Medium Cal/Frag Opaque B-kits
- Transparent Armor

Appliqué Armor (C-kit)

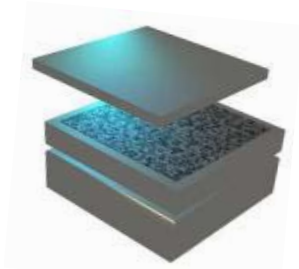
- Passive Multi-Threat
- Reactive Multi-Threat
- Active Multi-Threat

Design/Integration Enablers

- Common & Modular Armor System Integration Performance
- Modeling & Simulation
- Survivable Structure Concepts
- Testing Capabilities
- Sensors



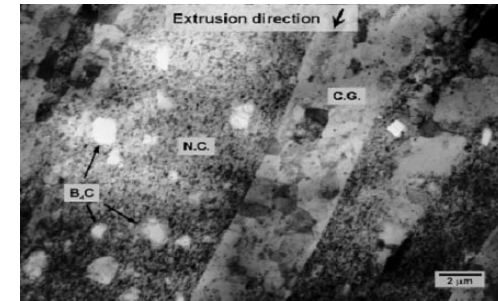
- Applied research is being conducted to develop new materials for threat defeat and to improve existing materials



Encapsulated Ceramics



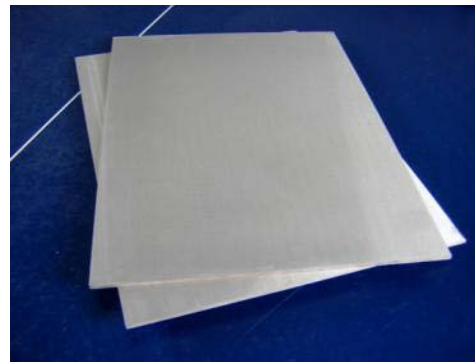
Engineered Materials



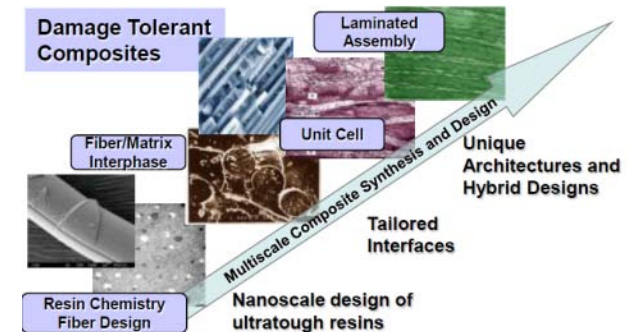
Metal Matrix Composites



Transparent Ceramics

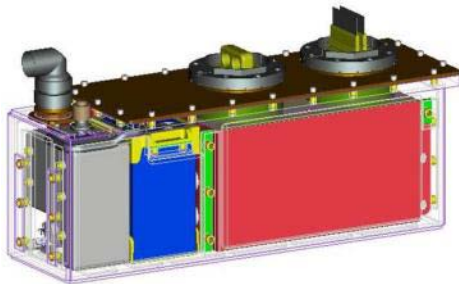


Armor Grade Magnesium



Damage Tolerant High Strength Composites

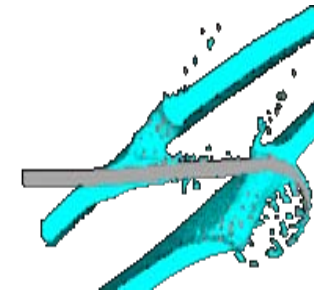
- Mechanism Research is required to develop and refine methods of defeating threats
 - Requires an understanding of how the threat functions pre and post initiation
 - Requires an understanding of how the enemy is employing the threat
 - Can provide significant weight savings over “simple” material defeat



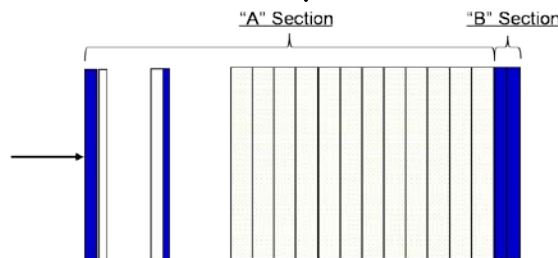
Electro-Magnetic Armor (EMA)



Multi-threat Passive



Tuned Explosive Reactive



Hybrid Armors

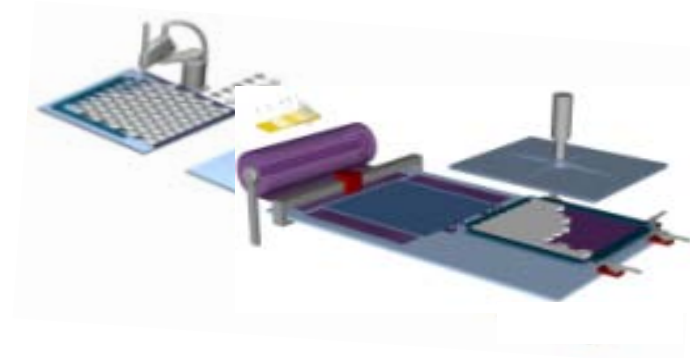
- Advanced technologies exist at TRL 4+, but are high-priced
 - Advances in manufacturing techniques/processes are required to reduce costs
 - Funding of Manufacturing Technology (MANTECH) efforts is a necessity
 - Better manufacturing techniques can enhance material performance
 - Cost of equipment for large scale production is too great for private industry without known customer
 - “Catch-22” – Costs will not go down further without volume, but cost is too great to attract a customer initially
 - Raw material costs are dictated by the market/demand
 - Can be reduced through research, however will eventually reach a price point that cannot be decreased



Ceramic Processing



Friction Stir Welding and joining
of dissimilar metals



Build-to-print Armor Panels